

IN THE CLAIMS

1. (currently amended) An optical switch comprising:

a pair of opposed optical arrays, each optical array including a fixed mirror and a plurality of independently tiltable mirrors;

at least one input port, disposed within one of the optical arrays, for launching a beam of light towards the fixed mirror in other optical array, which redirects the beam of light for multiple passes between the tiltable mirrors in both optical arrays to the fixed mirror in the one optical array;

at least two output ports, disposed within the other optical array, for selectively receiving the beam of light from the fixed mirror in the one optical array; and

an ATO element having optical power disposed between the pair of opposed optical arrays for directing the beam of light during each pass passing between the optical arrays.

2. (original) The optical switch as defined in claim 1, wherein the pair of opposed optical arrays is disposed in respective focal planes of the ATO element.

3. (original) The optical switch as defined in claim 2, wherein the ATO element has a focal length approximately equal to a near zone length or Rayleigh range of a beam of light incident thereon.

4. (original) The optical switch as defined in claim 2, wherein the at least one input port and the at least two output ports are optical bypasses for allowing a beam of light to pass through a respective one of the pair of opposed optical arrays.

5. (original) The optical switch as defined in claim 4, wherein the pair of opposed optical arrays, the at least one input port, the at least two output ports, and the ATO element are disposed about an optical axis of the ATO element.

6. (original) The optical switch as defined in claim 5, wherein the fixed mirror of each of the pair of opposed optical arrays is positioned along the optical axis of the ATO element.

7. (currently amended) An optical switch comprising:

a plurality of input ports at least one input port for launching beams a beam of light into the optical switch;

a plurality of at least two output ports for selectively receiving the beams beam of light from the input ports ~~an optical path between the at least one input port and a selected one of the at least two output ports;~~

an angle-to-offset(ATO) element having optical power for performing an angle-to-offset transformation, said ATO element being disposed for redirecting the beams beam of light traveling between the ~~at least one input ports port~~ and the ~~at least two output ports;~~

a first plurality of independently tiltable deflectors and a second plurality of independently tiltable deflectors ~~the first and the second plurality of independently tiltable deflectors~~ for switching the beams beam of light ~~along an optical path~~ via the ATO element;

a first at least one fixed deflector for receiving the beams beam of light from each input port via the ATO element, and for deflecting the each beam of light to one of the first plurality of independently tiltable deflectors via the ATO element, and

a second fixed deflector for receiving each the beam of light from ~~one~~ of the second plurality of independently tiltable deflectors via the ATO element, and for deflecting each the beam of light to a selected ~~one of the at least two output port ports~~ via the ATO element.

8. (original) The optical switch as defined in claim 7, wherein the ATO element has a focal length approximately equal to a near zone length or Rayleigh range of a beam of light incident thereon.

9. (currently amended) The optical switch as defined in claim 8, wherein the ~~at least one input ports port~~, the ~~at least two output ports~~, the ATO element, the first plurality array of deflectors, and the second plurality array of deflectors are disposed about an optical axis of the ATO element.

10. (currently amended) The optical switch as defined in claim 9, wherein each the beam of light is redirected five times by the ATO element ~~along an optical path between the at least one of the input ports port and a selected one of the at least two output ports.~~

11. (currently amended) The optical switch as defined in claim 9, wherein the first plurality of deflectors and the second plurality of deflectors are disposed on a first MEMS chip and a second MEMS chip, respectively; and wherein the ~~at least one input ports port~~ and the ~~at least two output ports~~ are disposed at optical bypass regions of the first and the second MEMS chip, respectively.

12. (original) The optical switch as defined in claim 7, wherein the ATO element is one of a focusing lens, a GRIN lens, and a concave mirror.

13. (currently amended) The optical switch as defined in claim 7, wherein the ATO element is a concave mirror; and wherein the first and second at least one fixed deflectors deflector comprises a single fixed mirror deflector.

14. (currently amended) The optical switch as defined in claim 13, wherein the at least one input ports port, the at least two output ports, the first plurality of deflectors, the second plurality of deflectors, and the single fixed mirror deflector are disposed adjacent each other remote from the concave mirror.

15. (currently amended) An optical switch comprising:

a plurality of at least one input ports port for launching beams a beam of light into the optical switch;

a plurality of at least two output ports for selectively receiving the beams beam of light from a plurality of optical paths between the input ports and the output ports;

an angle-to-offset (ATO) element having optical power for performing an angle-to-offset transformation, said ATO element being disposed for redirecting the beams of light traveling between the input ports and the output port; and

a first array of tilting deflectors and a second array of tilting deflectors for switching each the beam of light from one of the at least one input ports port to a selected one of the at least two output ports, and

a fixed deflector, which receives each of the beams of light from the input ports via the ATO element for directing the beams of light to the first array of tilting deflectors, and which receives the beams of light from the second array of tilting deflectors via the ATO element for directing each beam of light to the selected output port;

wherein the switching is performed along an optical path including the first and the second array of deflectors and the ATO element, and

wherein each the beam of light is redirected five times by the ATO element when switching between the input ports and a beam of light to a selected one of the at least two output ports.

16. (Canceled)

17. (Cancelled)

18. (currently amended) The optical switch as defined in claim 15 +7, wherein the ATO element comprises a concave mirror.

19. (currently amended) The optical switch as defined in claim 18, wherein the ~~at least one input ports port~~, the ~~at least two~~ output ports, the first plurality of deflectors, the second plurality of deflectors, and the ~~single~~ fixed deflector are disposed adjacent each other in a focal plane of the concave mirror.

20. (currently amended) The optical switch as defined in claim 19, wherein the ~~single~~ fixed deflector is disposed along an optical axis of the concave mirror; wherein the first plurality of deflectors and each of the input ports are disposed on opposite sides of the ~~single~~ fixed deflector; wherein the second plurality of deflectors is disposed adjacent to the first plurality of deflectors; and wherein the output ports are disposed adjacent to each of the input ports.